IN THE CLAIMS:

Amend claim 1 and add new claims 25-35 as shown in the following listing of claims, which replaces all previous listings and versions of claims.

1. (currently amended) A magnetic bearing device, comprising:

a ~~rotor.~~ rotor;

a plurality of electromagnets for controlling a radial position and/or an axial position of the rotor;

a power source for supplying power to the electromagnets;

a common node commonly connected to each one end of the ~~electromagnets.~~ electromagnets;

switch means for switching a voltage of the common node; and

excitation control means for controlling excitation of each of the electromagnets by a supply current that is supplied from the other end of one of the electromagnets to a negative electrode of the power source and that flows through the electromagnets in one direction, or by a regenerated current that is regenerated from the other end of one of the electromagnets to a positive electrode of the power source and that flows through the electromagnets in one direction; ~~wherein~~

wherein the switch means includes:

a first switch element for connecting and disconnecting between the positive electrode and the common node; and

a first rectifier element for causing a current to flow from the negative electrode to the common node; and

wherein the excitation control means includes:

a second switch element for connecting and disconnecting between the other end of one of the electromagnets and the negative electrode; and

a second rectifier element for causing a current to flow from the other end of one of the electromagnets to the positive electrode.

2. (withdrawn) A magnetic bearing device, comprising:

a rotor;

a plurality of electromagnets for controlling a radial position and/or an axial position of the rotor;

a power source for supplying power to the electromagnets;

a common node commonly connected to each one end of the electromagnets;

switch means for switching a voltage of the common node; and

excitation control means for controlling excitation of each of the electromagnets by a supply current supplied from a positive electrode of the power source to the other end of one of the electromagnets, or by a regenerated current regenerated from a negative electrode of the power source to the other end of one of the electromagnets; wherein

the switch means includes:

a first switch element for connecting and disconnecting between the common node and the negative electrode; and

a first rectifier element for causing a current to flow from the common node to the positive electrode; and

the excitation control means includes:

a second switch element for connecting and disconnecting between the positive electrode and the other end of one of the electromagnets; and

a second rectifier element for causing a current to flow from the negative electrode to the other end of one of the electromagnets.

3.-4. (canceled)

5. (withdrawn) A magnetic bearing device, comprising:

a rotor;

a plurality of electromagnets for controlling a radial position and/or an axial position of the rotor;

a power source for supplying power to the electromagnets;

a common node commonly connected to each one end of the electromagnets;

switch means for switching a voltage of the common node;

a first excitation control means for controlling excitation of at least one of the plurality of electromagnets by a supply current supplied from the other end of one of the electromagnets to a negative electrode of the power source, or by a regenerated current regenerated from the other end of one of the electromagnets to a positive electrode of the power source; and

a second excitation control means for controlling excitation of electromagnets other than the at least one electromagnet controlled through excitation by the first excitation control means, by a supply current supplied from the positive electrode to the other end of another one of the electromagnets, or by a regenerated current regenerated from the negative electrode to the other end of the another one of the electromagnets; wherein

the switch means includes:

a switch element for connecting and disconnecting between the common node and the negative electrode, and a switch

element for connecting and disconnecting between the positive electrode and the common node; and

a rectifier element for causing a current to flow from the common node to the positive electrode, and causing a current to flow from the negative electrode to the common node, respectively;

the first excitation control means includes:

a switch element for connecting and disconnecting between the other end of one of the electromagnets and the negative electrode; and

a rectifier element for causing a current to flow from the other end of the one of the electromagnets to the positive electrode; and

the second excitation control means includes:

a switch element for connecting and disconnecting between the positive electrode and the other end of another one of the electromagnets; and

a rectifier element for causing a current from the negative electrode to the other end of the another one of the electromagnets.

6. (withdrawn) The magnetic bearing device according to claim 5, characterized in that the current caused to flow through each of the electromagnets is increased, decreased, or maintained to be constant by adjusting a switching phase of the switch means and control phases of the first excitation control

means and the second excitation control means within a common control cycle.

7.-11. (canceled)

12. (previously presented) The magnetic bearing device according to claim 1, wherein the current caused to flow through each of the electromagnets is increased, decreased, or maintained to be constant by adjusting a switching phase of the switch means and a control phase of the excitation control means within a common control cycle.

13. (previously presented) The magnetic bearing device according to claim 1, wherein the first rectifier element includes a third switch element connected in parallel therewith.

14. (withdrawn) The magnetic bearing device according to claim 2, wherein the current caused to flow through each of the electromagnets is increased, decreased, or maintained to be constant by adjusting a switching phase of the switch means and a control phase of the excitation control means within a common control cycle.

15. (withdrawn) The magnet bearing device according to claim 2, wherein the first rectifier element includes a third switch element connected in parallel therewith.

16. (withdrawn) The magnetic bearing device according to claim 5, wherein the plurality of electromagnets are constituted by being divided into two groups, one group controlled by the first excitation control means and the other group controlled by the second excitation control means so that the current caused to flow between the positive electrode and the common node and the current caused to flow between the common node and the negative electrode are made substantially equalized.

17. (previously presented) The magnetic bearing device according to claim 1, further comprising current detecting means for detecting a value of the current when a constant current is caused to flow through the electromagnets.

18. (previously presented) The magnetic bearing device according to claim 17, wherein the current detecting means includes a resistance having one end connected to the negative electrode, and a detection portion for detecting a current flowing through the resistance.

19. (withdrawn) The magnetic bearing device according to claim 6, wherein the plurality of electromagnets are constituted by being divided into two groups, one group controlled by the first excitation control means and the other group controlled by the second excitation control means so that the current caused to flow between the positive electrode and the

common node and the current caused to flow between the common node and the negative electrode are made substantially equalized.

20. (withdrawn) The magnetic bearing device according to claim 6, further comprising current detecting means for detecting a value of the current when a constant current is caused to flow through the electromagnets.

21. (withdrawn) A turbo molecular pump comprising the magnetic bearing device according to claim 6 mounted thereto, wherein the rotor has rotary vanes and a rotor shaft placed at the center of the rotary vanes; and each of the electromagnets levitates the rotor shaft by a magnetic force.

22. (previously presented) A turbo molecular pump comprising the magnetic bearing device according to claim 1 mounted thereto, wherein the rotor has rotary vanes and a rotor shaft placed at the center of the rotary vanes; and each of the electromagnets levitates the rotor shaft by a magnetic force.

23. (withdrawn) A turbo molecular pump comprising the magnetic bearing device according to claim 2 mounted thereto, wherein the rotor has rotary vanes and a rotor shaft placed at the center of the rotary vanes; and each of the electromagnets levitates the rotor shaft by a magnetic force.

24. (previously presented) A turbo molecular pump comprising the magnetic bearing device according to claim 1 mounted thereto, wherein the rotor has rotary vanes and a rotor shaft placed at the center of the rotary vanes; and each of the electromagnets levitates the rotor shaft by a magnetic force.

25. (new) The magnetic bearing device according to claim 1, wherein the number of electromagnets is three or greater, wherein the second switch element is not connected in parallel with a rectifier element, and wherein the second rectifier element is not connected in parallel with a switch element.

26. (new) The magnetic bearing device according to claim 1, wherein the second switch element and the second rectifier element are formed of a single switch element and a single rectifier element, respectively.

27. (new) A magnetic bearing device, comprising:

a rotor;

a plurality of electromagnets that control a radial position and/or an axial position of the rotor;

a power source that supplies power to the electromagnets;

a common node commonly connected to each one end of the electromagnets;

a switching circuit that switches a voltage of the common node, the switching circuit including a first switch element for connecting and disconnecting between one end of the power source and the common node, and a first rectifier element connected between the other end of the power source and the common node; and

an excitation control circuit that controls excitation of each of the electromagnets by a supply current that flows through the electromagnets in one direction or a regenerated current that flows through the electromagnets in one direction, the excitation control circuit including a second switch element that connects and disconnects between the other end of one of the electromagnets and the other end of the power source, and a second rectifier element connected between the other end of one of the electromagnets and the one end of the power source.

28. (new) The magnetic bearing device according to claim 27, wherein the number of electromagnets is three or greater, wherein the second switch element is not connected in parallel with a rectifier element, and wherein the second rectifier element is not connected in parallel with a switch element.

29. (new) The magnetic bearing device according to claim 27, wherein the second switch element and the second

rectifier element are formed of a single switch element and a single rectifier element, respectively.

30. (new) The magnetic bearing device according to claim 27, wherein the current caused to flow through each of the electromagnets is increased, decreased, or maintained to be constant by adjusting a switching phase of the switching circuit and a control phase of the excitation control circuit within a common control cycle.

31. (new) The magnetic bearing device according to claim 27, wherein the first rectifier element includes a third switch element connected in parallel therewith.

32. (new) The magnetic bearing device according to claim 27, further comprising a current detecting circuit that detects a value of the current when a constant current is caused to flow through the electromagnets.

33. (new) The magnetic bearing device according to claim 32, wherein the current detecting circuit includes a resistance and a detection portion for detecting a current flowing through the resistance.

34. (new) A turbo molecular pump comprising the magnetic bearing device according to claim 27 mounted thereto, wherein the rotor has rotary vanes and a rotor shaft placed at

the center of the rotary vanes; and each of the electromagnets levitates the rotor shaft by a magnetic force.

35. (new) A turbo molecular pump comprising the magnetic bearing device according to claim 27 mounted thereto.